# HONEYWELL SPEECH TECHNOLOGY
## IARPA ARTS LIGHTNING TALK

**Dr. Tor Finseth**
**Research Scientist, Aerospace Advanced Technologies**
**6/27/2023**

**Honeywell**

# USER-FOCUSED PRODUCT AREAS

**Visual:**
360 Display

**Interfaces:**
Anthem Flight Deck

**Monitoring:**
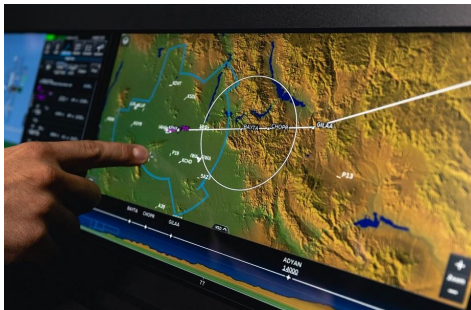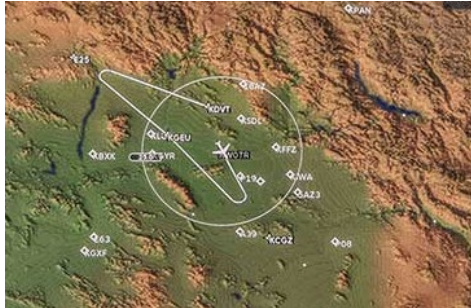Biosensing Apparel

**Speech:**
Vocollect Talkman

- **Speech Recognition / Speech control systems**
- **Natural Language Processing**
- **Paralinguistic Analysis Tasks**
- **Speech Enhancement**
- **Voice Activity Detection**
- **Speech Diarisation**
- **Speech Conversion**

# ANTHEM – VOICE ACTIVATED FLIGHT DECK

## Voice Capabilities

### Speech-Enabled INAV

- Turning layers on/off
- Map control functions
- Access/retrieve information on airports and frequencies



### Speech-Enabled Radio Tuning

- Radio tuning of COM/NAV/ADF
- Swapping standby/active frequencies
- Volume control



### Speech-Enabled Charts

- Opening charts associated with tabs
- Chart control functions (e.g., pan, split header, center chart, night mode)

# ATC TRANSCRIPTION



ATC

Pilot

## Problem:

Misinterpretation of radio communication have contributed to significant number of incidents/accidents.

Leading causes of error:

- Noise, overlapping communications
- Ambiguous communication
- Non-Standard Phraseology
- Regional differences
- Call sign mistakes
- Readback/Hearback, Confirmation bias
- Very high speaking rate

## Product solution:

Listens to incoming radio continuously

Transcribe <u>all</u> or <u>ownship</u> ATC communications

Allows pilots to "bookmark" clearances of interest for later review.

Allows pilots to play back each transcribed clearance.
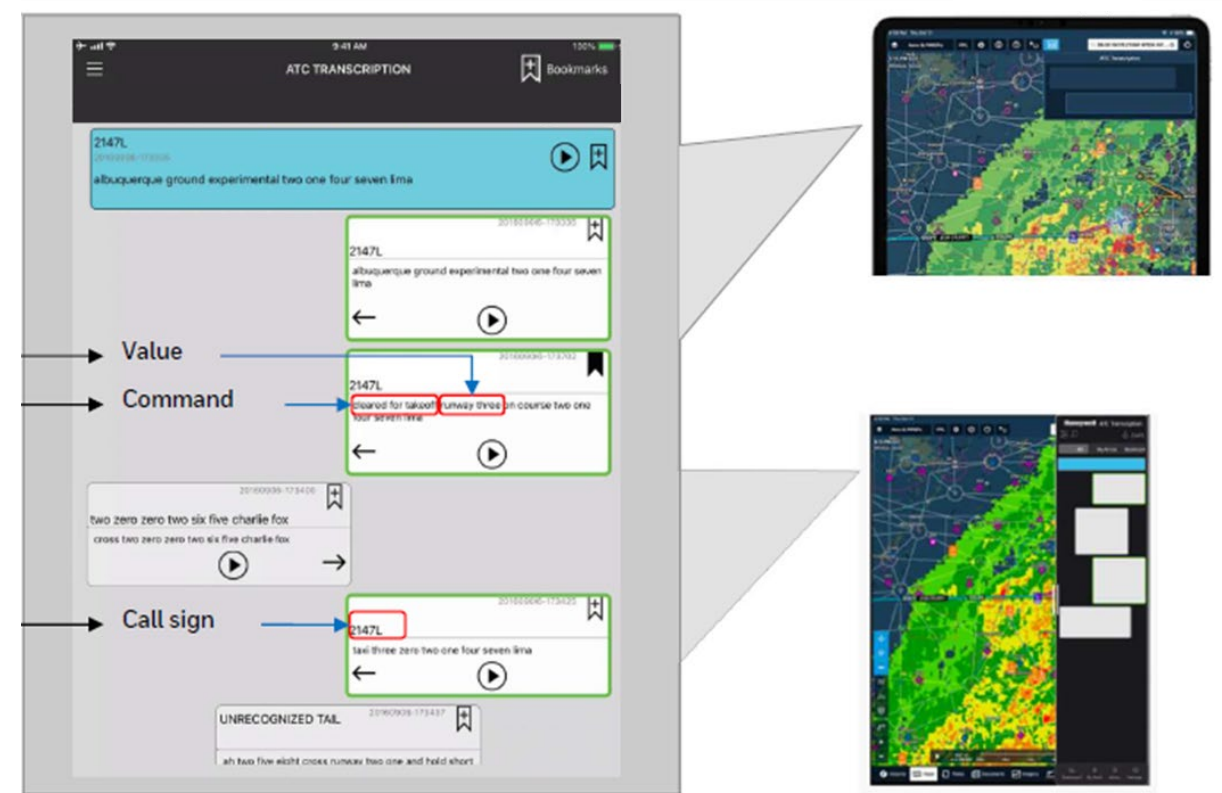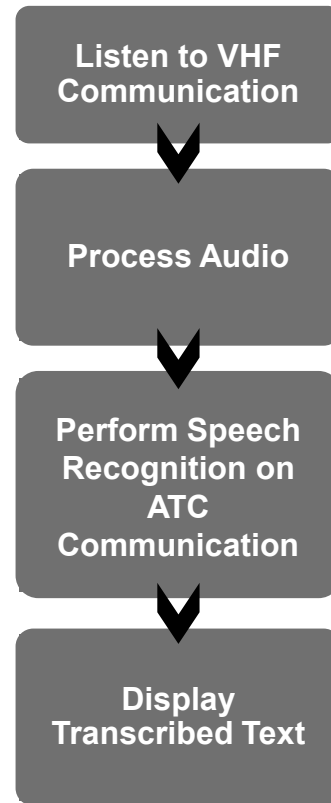
+ Rich set of additional features

4

# RELEVANT GOVERNMENT FUNDED PROJECTS

FAA Cognitive Skill Degradation – 2021

US Navy Honeywell Biosensing Apparel – 2021

AFRL UAS Autonomous Technologies for Terminal Airspace Operations – 2020

DARPA Ground X-Vehicle Technology (GXV-T) – 2016

DARPA Multifunction Radio Frequency – 2016

IARPA Strengthening Human Adaptive Reasoning and Problem Solving (SHARP) – 2013

DARPA Neurotechnology for Intelligence Analysts – 2008

DARPA Augmented Cognition – 2006

DARPA SandBlaster – 2006



*Honeywell GXV-T*

# THANK YOU

Dr. Tor Finseth
Research Scientist, Aerospace Advanced Technologies

Tor.Finseth@honeywell.com

**Honeywell**